Water Resources

Chapter 3 · Geography

Reading Guide · Glossary · Comprehension · Practice Questions · 10 Puzzles

NCERT Companion Workbook · Based on “Contemporary India II, Geography, NCERT Class X”

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Chapter Overview

This chapter examines why water scarcity can occur even in places with plenty of rainfall, tracing it to over-use, pollution and unequal access rather than nature alone. It weighs the benefits multi-purpose river projects were meant to deliver against the ecological and social costs they have actually caused. The second half turns to rainwater harvesting, contrasting centuries-old regional techniques with their modern revival.

Reading & Study Guide

Section	What to Focus On
Water Scarcity and the Need for Conservation	Notice why abundant water resources can still leave regions short.
Multi-Purpose River Projects	Weigh the stated benefits of dams against their real drawbacks.
Rainwater Harvesting	Compare ancient techniques with how they are being revived today.
Traditional Water Harvesting Structures	Track how khadins, johads and tankas suit different regions.
Hydraulic Structures in Ancient India	See how old dam and canal building shaped later practice.
Bamboo Drip Irrigation	Notice how a simple local system delivers water drop by drop.

Key Terms Glossary

Term	What It Means
HYDROLOGICAL	Natural cycle describing water's continuous movement on earth
FRESHWATER	Non-saline water usable for drinking and irrigation
GROUNDWATER	Water stored naturally beneath the earth's surface
SCARCITY	Shortage of water relative to people's needs
RESERVOIR	Large water body formed and held behind a dam
SPILLWAY	Structure through which a dam releases excess water
MULTIPURPOSE	A project serving irrigation, power and flood control together
SEDIMENT	Silt and soil particles carried and deposited by water
SALINISATION	Build-up of salt in soil from excess irrigation

HARVESTING	Collecting and storing rainwater for later use
ROOFTOP	Sloped house surface used to channel rain into storage
TANKA	Underground tank traditionally used to store rooftop rainwater
KHADIN	Rain-fed field structure used to moisten soil in Rajasthan
JOHAD	Traditional small earthen check dam for storing rainwater
CANAL	Artificial channel built to carry irrigation water
EMBANKMENT	Raised bank built to control river flow or flooding
IRRIGATION	Artificial supply of water to agricultural land
HYDEL	Relating to electricity generated using flowing water
FLOODPLAIN	Low-lying land beside a river prone to flooding
RUNOFF	Rainwater that flows over the land's surface
DAM	Barrier built across a river to store water
INUNDATION	Deliberate flooding of channels to irrigate fields
BAMBOO	Material used in Meghalaya's traditional drip irrigation pipes
RAINFALL	Precipitation that replenishes surface and groundwater sources
DROUGHT	Prolonged period of abnormally low rainfall

Comprehension Questions

Q1. Why can a region with high rainfall still suffer from water scarcity?

Q2. What role does growing population and industrialisation play in water scarcity?

Q3. What benefits do multi-purpose river projects offer, and what problems have they caused?

Q4. How does rooftop rainwater harvesting work in a place like Shillong?

Q5. Describe how a tanka stores and supplies drinking water in Rajasthan.

Q6. What is the purpose of the Jal Jeevan Mission?

Q7. How did dams built to control floods sometimes end up worsening them?

Q8. What ecological problems can result from damming and regulating rivers?

Short-Answer Practice (Worked Examples)

Q1. Name one traditional rainwater harvesting structure used in Rajasthan's semi-arid regions.

Q2. Which two states benefit from the Sardar Sarovar project's irrigation?

Q3. Why is river water considered a renewable resource despite scarcity concerns?

Q4. What made rooftop rainwater harvesting decline in parts of western Rajasthan in recent decades?

Q5. Why are dams sometimes called the 'temples of modern India'?

Objective Practice

A. Multiple Choice Questions

Circle the correct option.

1. A region with high annual rainfall but a large population is likely to be:

a) Free from water scarcity

b) Suffering from water scarcity

c) Unaffected by population size

d) Immune to pollution

2. Which of the following is NOT usually presented as an argument in favour of multi-purpose river projects?

a) They bring water to scarcity-hit areas

b) They help control floods

c) They cause large-scale displacement

d) They generate electricity

3. Underground tanks called tankas are especially associated with which region?

a) Coastal Kerala

b) Semi-arid western Rajasthan

c) The Gangetic plains

d) The Western Ghats

4. Meghalaya's traditional drip irrigation system uses pipes made of which material?

a) Clay

b) Bamboo

c) Iron

d) Plastic

5. The Sardar Sarovar Dam has been built on which river?

a) Narmada

b) Godavari

c) Krishna

d) Mahanadi

6. Rainwater stored in Rajasthan's tankas is locally referred to as:

a) Khadin pani

b) Johad pani

c) Palar pani

d) Kul pani

7. Which government mission aims to give rural households assured piped drinking water?

a) Atal Bhujal Yojana

b) Jal Jeevan Mission

c) Pradhan Mantri Krishi Sinchayee Yojana

d) Digital India

8. Gendathur, a village noted for rooftop rainwater harvesting, is located in which state?

a) Rajasthan

b) Karnataka

c) Meghalaya

d) Gujarat

9. Diversion channels called guls or kuls are traditionally found in which region?

a) The Thar desert

b) The Western Himalayas

c) The Deccan plateau

d) The Gangetic delta

10. Which state made rooftop rainwater harvesting structures compulsory by law?

a) Kerala

b) Rajasthan

c) Tamil Nadu

d) Karnataka

B. True or False

1. Three-fourths of the earth's surface is covered with water, but only a small share of it is usable freshwater.
2. Water scarcity occurs only in regions that receive low rainfall.
3. Multi-purpose projects integrate irrigation, power generation and flood control together.
4. Damming rivers has no effect on sediment flow or aquatic habitats.
5. Khadins and johads are traditional water harvesting structures associated with Rajasthan.
6. Rooftop rainwater harvesting is common in Shillong despite the region's very high rainfall.
7. The Atal Bhujal Yojana focuses mainly on urban flood control rather than groundwater management.
8. Irrigated agriculture is described as the largest consumer of water resources.

C. Match the Following

Column A	Column B
1. Tanka	a) Diversion channel used in the Western Himalayas
2. Khadin	b) Multi-purpose project built on the Narmada river

3. Kul or gul	c) Deposit of silt that lowers a reservoir's capacity
4. Bamboo drip system	d) Excess salt build-up caused by over-irrigation
5. Sardar Sarovar Dam	e) Traditional irrigation method used in Meghalaya
6. Jal Jeevan Mission	f) Rain-fed field structure that moistens soil
7. Sedimentation	g) Underground tank for storing rooftop rainwater
8. Salinisation	h) Scheme for piped drinking water to rural homes

Higher-Order Thinking (HOTS) Questions

Q1. The chapter shows dams both preventing and causing floods. How can excessive sedimentation in a reservoir turn a flood-control structure into a flood risk?

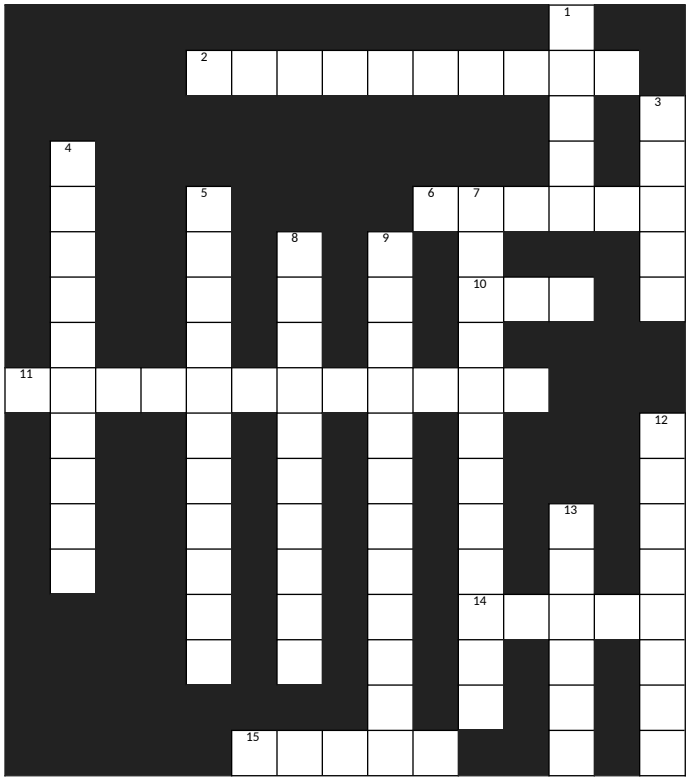
Q2. Why might traditional rainwater harvesting be a more sustainable option for water-scarce hill towns like Shillong than building a large dam?

Q3. Compare how the reasons for water scarcity differ between a drought-prone desert village and a densely populated city with adequate rainfall.

Q4. What trade-offs would a state government have to weigh before starting a new multi-purpose river project today, given the concerns raised in the chapter?

Puzzle Pack -- 10 Puzzles for This Chapter

1. Crossword



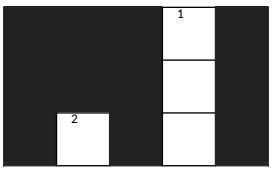
ACROSS

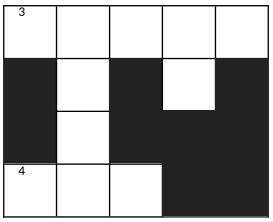
2. Artificial supply of water to agricultural land
6. Rain-fed field structure used to moisten soil in Rajasthan
10. Barrier built across a river to store water
11. Build-up of salt in soil from excess irrigation
14. Artificial channel built to carry irrigation water
15. Relating to electricity generated using flowing water

DOWN

1. Traditional small earthen check dam for storing rainwater
3. Underground tank traditionally used to store rooftop rainwater
4. Deliberate flooding of channels to irrigate fields
5. Water stored naturally beneath the earth's surface
7. Natural cycle describing water's continuous movement on earth
8. Non-saline water usable for drinking and irrigation
9. A project serving irrigation, power and flood control together
12. Structure through which a dam releases excess water
13. Rainwater that flows over the land's surface

2. Mini Crossword





ACROSS

3. Artificial channel built to carry irrigation water
4. Barrier built across a river to store water

DOWN

1. Traditional small earthen check dam for storing rainwater
2. Underground tank traditionally used to store rooftop rainwater

3. Word Search

C	M	U	L	T	I	P	U	R	P	O	S	E	B	M
A	B	Q	T	N	E	M	K	N	A	B	M	E	O	A
N	I	G	N	I	T	S	E	V	R	A	H	V	T	D
A	S	A	L	I	N	I	S	A	T	I	O	N	C	L
L	H	N	F	R	E	S	H	W	A	T	E	R	A	F
G	R	O	U	N	D	W	A	T	E	R	N	C	L	R
Y	S	I	K	O	R	V	U	W	D	O	I	O	E	K
T	S	T	H	S	S	C	F	R	I	G	O	S	R	Y
I	E	A	A	C	D	Q	O	T	O	D	E	A	F	A
C	D	D	D	O	W	U	A	L	P	R	I	H	F	W
R	I	N	I	N	G	G	O	L	V	N	H	Y	O	L
A	M	U	N	H	I	R	A	O	F	N	W	D	N	L
C	E	N	T	R	D	I	I	A	S	Z	M	E	U	I
S	N	I	R	Y	N	R	L	Q	D	I	E	L	R	P
C	T	I	H	D	S	L	W	B	A	M	B	O	O	S

Find: BAMBOO · CANAL · DAM · DROUGHT · EMBANKMENT · FLOODPLAIN · FRESHWATER · GROUNDWATER · HARVESTING · HYDEL · HYDROLOGICAL · INUNDATION · IRRIGATION · KHADIN · MULTIPURPOSE · RAINFALL · RESERVOIR · RUNOFF · SALINISATION · SCARCITY · SEDIMENT · SPILLWAY

4. Cryptogram

Each letter was replaced by another. Crack the code.

ZSGUSPFH MAZJWZ PTRPG FX SXTZWUOW GTR ZJGUW WOWUH RUXM XY IGFWU.

5. Caesar Coded Message

Every letter is shifted by the same amount. Find the shift.

IMFQD DQEAGDOQE. EOMDOUFK BGETQE UZPUM FA OAZEQDHQ MZP ETMDQ QHQDK PDAB AR IMFQD.

6. Word Scramble

Unscramble each set of letters using the clue.

1. RRIGITIAON -- Artificial supply of water to agricultural land
2. SIIINNATSOLA -- Build-up of salt in soil from excess irrigation
3. RRADGNUTEOW -- Water stored naturally beneath the earth's surface
4. FRUFON -- Rainwater that flows over the land's surface
5. KIDHNA -- Rain-fed field structure used to moisten soil in Rajasthan
6. ANIFODPLLO -- Low-lying land beside a river prone to flooding
7. KNAAT -- Underground tank traditionally used to store rooftop rainwater
8. HLEDY -- Relating to electricity generated using flowing water
9. DOAJH -- Traditional small earthen check dam for storing rainwater
10. IRFANLLA -- Precipitation that replenishes surface and groundwater sources

7. Acrostic

The highlighted letters spell a theme.

R _ _ _ _ _ _ _ _ _ Large water body formed and held behind a dam

A _ _ _ _ _ _ _ _ _ _ _ _ Natural cycle describing water's continuous movement on earth

I _ _ _ _ _ _ _ _ _ _ Artificial supply of water to agricultural land

N _ _ _ _ _ _ _ _ _ _ Water stored naturally beneath the earth's surface

W _ _ _ _ _ _ _ _ _ Non-saline water usable for drinking and irrigation

A _ _ _ _ _ _ _ Shortage of water relative to people's needs

T _ _ _ _ _ Underground tank traditionally used to store rooftop rainwater

E _ _ _ _ _ _ _ _ _ Raised bank built to control river flow or flooding

R _ _ _ _ _ _ Sloped house surface used to channel rain into storage

8. Match the Pairs

Match Column A with Column B.

Column A	Column B
A. SALINISATION	1. Traditional small earthen check dam for storing rainwater
B. JOHAD	2. Non-saline water usable for drinking and irrigation
C. EMBANKMENT	3. Build-up of salt in soil from excess irrigation
D. IRRIGATION	4. Artificial supply of water to agricultural land
E. FRESHWATER	5. Underground tank traditionally used to store rooftop rainwater

F. INUNDATION	6. Precipitation that replenishes surface and groundwater sources
G. RAINFALL	7. Raised bank built to control river flow or flooding
H. TANKA	8. Deliberate flooding of channels to irrigate fields

9. Fill in the Blanks

Fill each blank.

1. Excess salt build-up in over-irrigated soil is known as _____.
2. A shortage of water relative to people's needs is known as water _____.
3. Water that seeps beneath the earth's surface and is later drawn up is called _____.
4. A prolonged period of abnormally low rainfall is called a _____.
5. A project combining irrigation, power and flood control is called a _____ project.
6. A rain-fed field structure used to moisten soil in Jaisalmer is called a _____.
7. In Rajasthan, rooftop rain is stored in an underground tank called a _____.
8. Meghalaya's centuries-old system uses _____ pipes to deliver water drop by drop.

10. Odd One Out

Circle the item that does not belong.

1. Tanka Spillway Khadin Johad
2. Runoff Rainfall Salinisation Groundwater
3. Hydel power Poaching Irrigation Flood control
4. Reservoir Kul channel Bamboo drip system Rooftop harvesting